DOCUMENT RESUME

ED 073 570 24 EA 005 032

AUTHOR	Knezevich, S. J.; Way, Russell
TITLE	The Generation of Multiunit School Instructional Organization Models for Secondary Schools. Theoretical Paper No. 38.
INSTITUTION	Wisconsin Univ., Madison. Research and Development Center for Cognitive Learning.
SPONS AGENCY	Office of Education (DHEW), Washington, D.C. Research and Development Centers Branch.
BUREAU NO	BR-5-0216
PUB DATE	Sep 72
CONTRACT	OEC-5-10-154
NOTE	39p.; Report from the Facilitative Environments Project
EDRS PRICE	MF-$0.65 HC-$3.29
DESCRIPTORS	Curriculum; Educational Innovation; Individual Instruction; Instructional Design; *Instructional Innovation; *Models; *Multiunit Schools; Organization; *School Organization; *Secondary Schools
IDENTIFIERS	IGE; Individually Guided Education; *Instructional Organization

ABSTRACT

The purpose of this theoretical paper is to describe a set of models for the instructional organization of the multiunit secondary school. The school's instructional organization is viewed as a mechanism for structuring resources to influence learning outcomes. The multiunit elementary school (MUS-E) models served as the point of departure for extending individually guided education (IGE) to the secondary levels. The major variables that influenced the design of the IGE/multiunit secondary school (MUS-S) were characteristics of the individual learner, insights into human abilities and learning, and the structure of the learning environment. A "multiunit component crosswalk" was created to identify MUS-E components (such as nongrading, staff hierarchies, and continuous progress) that could be applied to middle and senior high school levels. A modular instructional organization was generated for the IGE/MUS-S. The basic components were the "Individually Guided Inter-Disciplinary" Module, which includes all required experiences, and the "Enrichment" Module, which includes all elective experiences. Each module was comprised of a learner unit, instructional unit, curriculum unit, and decision unit. Variations of IGE/MUS-S models were developed for junior high, middle, and senior high schools of various sizes. (Author/DN)

FILMED FROM BEST AVAILABLE COPY

ED 073570

Theoretical Paper No. 38

THE GENERATION OF MULTIUNIT SCHOOL INSTRUCTIONAL ORGANIZATION MODELS FOR SECONDARY SCHOOLS

by

S. J. Knezevich, Principal Investigator
Wisconsin Research and Development Center for Cognitive Learning

and

Russell Way
Wisconsin State Department of Public Instruction

Report from the
Facilitative Environments Project

Wisconsin Research and Development
Center for Cognitive Learning
The University of Wisconsin
Madison, Wisconsin

September 1972

U.S. DEPARTMENT OF HEALTH, EDUCATION & WELFARE
OFFICE OF EDUCATION
THIS DOCUMENT HAS BEEN REPRODUCED EXACTLY AS RECEIVED FROM THE PERSON OR ORGANIZATION ORIGINATING IT. POINTS OF VIEW OR OPINIONS STATED DO NOT NECESSARILY REPRESENT OFFICIAL OFFICE OF EDUCATION POSITION OR POLICY

EA 005 032

Published by the Wisconsin Research and Development Center for Cognitive Learning, supported in part as a research and development center by funds from the United States Office of Education, Department of Health, Education, and Welfare. The opinions expressed herein do not necessarily reflect the position or policy of the Office of Education and no official endorsement by the Office of Education should be inferred.

Center No. C-03 / Contract OE 5-10-154

Statement of Focus

Individually Guided Education (IGE) is a new comprehensive system of elementary education. The following components of the IGE system are in varying stages of development and implementation: a new organization for instruction and related administrative arrangements; a model of instructional programing for the individual student; and curriculum components in prereading, reading, mathematics, motivation, and environmental education. The development of other curriculum components, of a system for managing instruction by computer, and of instructional strategies is needed to complete the system. Continuing programmatic research is required to provide a sound knowledge base for the components under development and for improved second generation components. Finally, systematic implementation is essential so that the products will function properly in the IGE schools.

The Center plans and carries out the research, development, and implementation components of its IGE program in this sequence: (1) identify the needs and delimit the component problem area; (2) assess the possible constraints—financial resources and availability of staff; (3) formulate general plans and specific procedures for solving the problems; (4) secure and allocate human and material resources to carry out the plans; (5) provide for effective communication among personnel and efficient management of activities and resources; and (6) evaluate the effectiveness of each activity and its contribution to the total program and correct any difficulties through feedback mechanisms and appropriate management techniques.

A self-renewing system of elementary education is projected in each participating elementary school, i.e., one which is less dependent on external sources for direction and is more responsive to the needs of the children attending each particular school. In the IGE schools, Center-developed and other curriculum products compatible with the Center's instructional programing model will lead to higher student achievement and self-direction in learning and in conduct and also to higher morale and job satisfaction among educational personnel. Each developmental product makes its unique contribution to IGE as it is implemented in the schools. The various research components add to the knowledge of Center practitioners, developers, and theorists.

Table of Contents

		Page
	List of Tables	vii
	List of Figures	vii
	Abstract	ix
I.	Introduction	1
	Brief History	1
	Models	2
	Multiunit School Models	2
II.	The MUS-E Model Components and Their Possible Impact on MUS-S Models	5
	Some Problems in Secondary Multiunit Model Development	5
	Possible Solutions for IGE/MUS-S Models	8
III.	Conceptual Framework for the Generation of Multiunit School Models at the Secondary Levels	11
IV.	More Detailed Description of Operational Multiunit Secondary School Models	15
	Iconic Models of Multiunit Secondary Schools	15
V.	Summary	25
VI.	IGE/MUS-S Staff Development Strategies and Materials	31
	Appendix: Glossary of Acronyms and Terms	33

List of Tables

Table		Page
1	Multiunit Component "Crosswalk" to Facilitate Comparisons Between Elementary and Secondary School Levels	6
2	IGID Mod Options for Multiunit Secondary School Models	16

List of Figures

Figure		Page
1	Scheduling alternatives for multiunit secondary school models.	18
2	General time schedule for multiunit secondary schools.	20
3	The fundamental instructional unit: First-generation IGE/MUS-S model.	21
4	The fundamental instructional unit: Second-generation IGE/MUS-S model—the unified version.	22
5	The fundamental instructional unit: Second-generation IGE/MUS-S model—the split version.	22
6	Iconic model of a comprehensive multiunit secondary school.	26
7	Organizational chart for a comprehensive multiunit secondary school.	27

Abstract

Expressions of interest to extend IGE/multiunit school concepts to the secondary school level have come from many different quarters. The purpose of this theoretical paper is to describe a set of models for the instructional organization of the multiunit secondary school. The school's instructional organization is viewed as a mechanism for structuring resources to influence learning outcomes.

The IGE/multiunit elementary school models were developed originally at the Wisconsin R & D Center. The MUS-E models served as the point of departure for extending IGE to the secondary levels. The major variables that influenced the design of the IGE/MUS-S (multiunit secondary school) were characteristics of the individual learner, insights into human abilities and learning, and the structure of the learning environment.

A "multiunit component crosswalk" was created to identify MUS-E components (such as nongrading, staff hierarchies, and continuous progress) that could be applied to middle and senior high school levels. Many MUS-E components could fit into MUS-S models, but a number of problem areas were discovered, such as the basis for organizing learner units, comprehensiveness of secondary programs, role of the subject specialist, required and elective course structures in secondary schools, fixed class schedules, and lack of individualized secondary curriculum instructional packages.

A modular instructional organization was generated for the IGE/MUS-S. The two basic components were the "Individually Guided Inter-Disciplinary" (IGID) Module, which includes all required experiences, and the "Enrichment" (E) Module, which includes all elective experiences. Each module was comprised of a learner unit, instructional unit, curriculum unit, and decision unit. The school-within-a-school concept was embraced for large-enrollment schools to be subdivided into houses. The Instructional Leadership Council (ILC) was recommended for each "house" and the Instructional Improvement Committee (IIC) would include all or representative ILC members plus the chief administrator of the school building. Variations of IGE/MUS-S models were developed for junior high, middle, and senior high schools of various sizes.

I
Introduction

During 1971-72, the number of school districts implementing the Individually Guided Education (IGE) system in a multiunit elementary school (MUS-E) framework increased dramatically. One indicator of the continuing high interest is the estimated 1,000 or more IGE/multiunit elementary schools that will be operational in the United States by the end of the 1972-73 school year. Successes registered to date and reactions from IGE/MUS-E[1] pioneers serve to focus attention on what happens to the student after experiencing the multiunit elementary school. Initial benefits gained from individually guided learning opportunities could be dissipated if the learner enrolled subsequently in schools where traditional group-oriented methods of instruction prevail. This can be expected in the typical secondary school. Many elementary school principals contemplating installation of IGE/MUS-E express concern about short-lived advantages of an instructional system confined to elementary schools.

Brief History

Several organizations have expressed interest at various times in stimulating the extension of IGE/multiunit school organizational concepts to the secondary school level. These include the Wisconsin State Department of Public Instruction, The Wisconsin School Boards Association, and the Wisconsin Research and Development Center. The hope of introducing the innovative instructional and organizational IGE/multiunit school concepts developed originally for elementary schools into secondary schools has been talked about for at least five years. Until recently, the time did not appear to be right to move in that direction.

Informal meetings between Russell Way of the Wisconsin Department of Public Instruction and S. J. Knezevich of the Wisconsin Research and Development Center during early January, 1972, revealed that independently developed ideas on the extension of multiunit concepts to the secondary schools were strikingly similar. An informal agreement between Way and Knezevich was reached to establish a cooperative effort to promote further development of a set of multiunit secondary school models. Original concept development and experience with the multiunit elementary school model were the points of departure or baselines used in generating a set of IGE/multiunit secondary school models. Primary writing responsibilities for various early versions as well as the final edition of this theoretical paper were assumed by S. J. Knezevich as principal investigator at the Wisconsin Research and Development Center. Publication of this theoretical paper and proprietary control of the models remain with the Wisconsin R & D Center.

The strategy for preparing the secondary multiunit school models began with the identification of the basic components of the multiunit elementary school (abbreviated MUS-E); each component was then analyzed to ascertain the nature and extent of modifications necessary to make it operational in a secondary school environment. Where voids or unresolved issues in the MUS-E model were discovered, new dimensions were added to the multiunit secondary school model. The analysis of MUS-E components included within the secondary school models and the ramifications of each for the secondary operations will be outlined in subsequent sections.

Model generation is essentially a creative activity. It may be related to existing models and may be influenced by empirical evidence. Ideas were merged at meetings between the writers, often after debates on the validity or clarity of prior positions. Various early editions of this theoretical paper were submitted to selected personnel in the Wisconsin R & D

---

[1] IGE/MUS-E, other acronyms, and basic concepts used in this paper are defined in the IGE/MUS-S Glossary found in the Appendix.

Center and the Wisconsin Department of Public Instruction. In addition, almost 100 educational practitioners from across the nation had access to a special edition. The diverse reactions obtained during the first four months of 1972 served as the "test bed" for the multiunit secondary school models. Recommendations gathered helped to refine preliminary concepts and influenced the production of this paper. The writers gratefully acknowledge the contributions of many school people in the design of the IGE/multiunit secondary school models described in the sections that follow.

Models

It is the purpose of this paper to describe a set of models for the instructional organization of the secondary school. The models provide a theoretical basis, or conceptual framework, for secondary school instructional patterns. For purposes of this paper, a model is considered to be synonymous with theory. It is defined as an abstracted representation of reality which reveals the key elements and the pattern of relations between factors of the situation, process, or thing under consideration. It is a simplified version of the real world which can facilitate comprehension as well as systematic manipulation and analysis of a situation, process, or thing being studied.

Bross[2] identified various types of models as physical (physical or concrete replicas), verbal (words or concepts that describe and explain phenomena), or symbolic (where symbols are related to each other in a quantitative manner). Other investigators refer to iconic models (scaled-down pictorial representations such as blueprints, maps, or diagrams), analog models (similar to or corresponding closely to the process or thing), and quantitative models (those which facilitate measurement or aid in observation).

Models are practical; that is, they are useful for a number of purposes. Deutsch referred to the organizing, heuristic, predictive, and mensurative functions of models.[3]

---

[2]Irwin Bross, Design for Decision, New York: Macmillan Co., 1953, pp. 161-182.

[3]Karl W. Deutsch, "On Communication Models in the Social Sciences," Public Opinion Quarterly, Vol. 16, No. 3, 1952, pp. 356-357.

Multiunit School Models

Models are useful to the researcher and practitioner in many ways. They enable those involved to perceive relations which underlie pertinent facts. The models to be generated herein focus on the client service function of educational institutions. Teaching, learning, counseling, and curriculum models are related to the services rendered by schools to "clients," more popularly referred to as learners, pupils, or students. More specifically, the conceptual framework needed to better comprehend the manner in which schools are organized for purposes of instruction will be described. The focus will be on the multiunit school instructional organizational pattern which facilitates the translation of "individually guided education" into a meaningful and successful operation. A brief review of the origins of the multiunit elementary school model is in order, for, as suggested earlier, it provides the bedrock upon which the multiunit secondary school models shall be built.

The IGE multiunit elementary school model, developed originally at the Wisconsin R & D Center during the last half of the 1960's, is an instructional system calling for: (a) the establishment of a unique pattern for organizing instructional resources, and (b) the utilization of a rational set of flexible and individualized instructional strategies. The multiunit school pattern is a facilitative mechanism; that is, a means for reaching other educational goals and influencing learning outcomes. Its primary purpose is to facilitate what the Wisconsin R & D Center identifies as the system of Individually Guided Education (IGE). Because the multiunit elementary school is so closely related to IGE, it is referred to frequently as the IGE/MUS-E. The multiunit secondary school is likewise dedicated to the principles of individually guided education and may be identified as IGE/MUS-S, where MUS-S is read as multiunit school-secondary or multiunit secondary school.

The instructional organization for a school is a mechanism for structuring (relating) resources such as teachers, teaching strategies, time, and space to influence learning outcomes in a positive manner. Hopefully, the organizational pattern selected will make it easier for teachers to implement an individually guided education program. The pattern developed for organizing instructional resources must, therefore, ultimately find its justification in learning theory. This is easier said than done, for human learning is complex. Furthermore, there are

numerous theories about the nature of human learning. The translation of laboratory models of the learning process into practical operating procedures in the schools is likewise no simple task. It is not unusual to find significant parts of a learning theory "lost in translation" through efforts to develop a set of instructional operations consistent with the theory.

It is beyond the scope of this paper to review in detail the meaning and substance of various learning theories and their implications for educational institutions. We shall make explicit some assumptions about factors we believe influence learning outcomes. The relationships, particularly the consistency, between these assumptions on human learning and the multiunit school organizational pattern will be described. This will constitute the rationale from which the model for instructional organization for secondary schools will evolve.

A number of human characteristics which influence learning outcomes have been identified by researchers and writers, although the precise weighting attached to each variable and the interrelationships among them are not always made explicit. Factors such as an individual's intellectual ability, maturity level, interests, unsatisfied needs, breadth of experience, emotional health, physical condition, and socioeconomic background may influence learning outcomes to a considerable degree. This is by no means an exhaustive listing of learning variables.

What can be called "the structure of the learning environment" includes a variety of additional variables likely to have an important impact on learning. The discipline itself, that is, the content of what is to be learned or skills to be developed, is part of that environment. The available resources, human and material, represent another environmental dimension. Included as well would be the available technology used to reach learning objectives.

To summarize, key variables to be considered in the design of operational instructional organization models, in this particular case those for multiunit schools, are:

1. The individual learner—his emotional and intellectual characteristics, socioeconomic background, experiences, and growth rates
2. Insights into human abilities and learning—assumptions and systems related to how learning can be stimulated among learners at various stages of development and influenced by
   a. Instructional strategies which have an impact on learner behavior
   b. Instructional technology
3. The structure of the learning environment—which would include
   a. Human instructional resources available: the type, quantity, variety, and quality of specialists who can be employed for learning tasks
   b. Opportunities for professional instructional personnel to interact more effectively with each other and with learners as well as for interaction among students
   c. Nature, organization, and perceived relevance of content to be learned, attitudes to be acquired, and skills to be developed
   d. The manner in which the educational institution is organized and operated

These factors influenced the development of the elementary multiunit school (MUS-E) model. How they influenced the generation of new models for multiunit secondary schools (MUS-S) will be described in greater detail in Section II.

II
The MUS-E Model Components and Their Possible Impact on MUS-S Models

All multiunit school instructional organizational models, and this applies to the MUS-S models as well, trace their origins to the modified and unmodified components of the MUS-E model developed in the mid 1960's by Klausmeier and others.[4] Special recognition as well as credit are given to the creative and innovative pioneering work by Klausmeier. As a matter of record, the multiunit secondary school model development began with the identification of the components of the MUS-E model. This was followed by an analysis of the modifications needed to apply each component to the middle school and senior high school levels. A "Multiunit Component Crosswalk" was created to facilitate comparisons between elementary and secondary levels. The twelve basic multiunit school elements considered in the generation of the MUS-S models are summarized in what is called a "Crosswalk" in Table 1. To illustrate, some components of the MUS-E (such as nongrading, continuous progress policy, creation of hierarchies of instructional specialists, and cooperative planning of instructional strategies among teachers) can be applied to the middle school and senior high school levels without major modifications. Other components, such as the bases used for forming learner units and the mechanisms for sharing instructional leadership through the IIC, may call for substantial modification of the MUS-E model to fit secondary school demands.

---

[4]See H. J. Klausmeier et al., Individually Guided Education and the Multiunit Elementary School: Guidelines for Implementation, Madison, Wisconsin: The Wisconsin Research and Development Center for Cognitive Learning, 1971.

Some Problems in Secondary Multiunit Model Development

The MUS-E organizational components that can be applied to the secondary levels without major modifications represent the starting point and not the termination of efforts. It is important to analyze other key issues if adaptation of multiunit components to the secondary levels is to be operationally feasible. There are dimensions of the multiunit school models which may not be considered relevant at the MUS-E level, but which may be very significant for success at the MUS-S levels. As will be demonstrated, the MUS-S models will have components and degrees of emphasis which will make it unique and different from the MUS-E. To illustrate, some key issues in several of the MUS-S models are:

1. The basis employed for organizing learner units (L-units). This is a dimension of considerable importance in the generation of multiunit secondary school models. Departmentalization, more pronounced at the senior high level than elsewhere, presents an instructional reorganization challenge far more difficult than that encountered in the traditional elementary school with self-contained classrooms. High school instructional patterns give evidence of even greater rigidity. These patterns are not only "self-contained" with the single teacher operating in splendid isolation, but also are fragmented into separate disciplines which are broken down further into grade levels. Teacher certification laws reinforce the present operational modes.

   Adolescence may further exacerbate efforts to promote multiage grouping

Table 1
Multiunit Component "Crosswalk"
To Facilitate Comparisons Between
Elementary and Secondary School Levels

(A) Multiunit Elementary School Component (MUS-E)	(B) Possible Application of the MUS-E Component to the Multiunit Middle School	(C) Possible Application of the MUS-E Component to the Multiunit Senior High School
1. Organization of learner units ranging in size from 75 to 150 pupils for purposes of instruction; multiage and cross-grade grouping of learners within such units	1. Organization of learner units ranging in size from 75 to 150 pupils for purposes of instruction; multiage and cross-grade grouping of learners within such units	1. Organization of learner units based on: (a) Multiage grouping with no more than two grade levels (b) Cross-grade grouping within one discipline (but no more than two grade levels) (c) Cross-grade, cross-discipline grouping (d) Combinations of the above depending upon whether general education, vocational, or elective courses are pursued
2. Nongrading	2. Nongrading	2. Nongrading
3. Continuous progress policy	3. Continuous progress policy	3. Continuous progress policy
4. Teams or hierarchies of instructional specialists (an instructional unit) employed for each learner unit	4. Teams or hierarchies of instructional specialists (an instructional unit) employed for each learner unit	4. Teams or hierarchies of instructional specialists (an instructional unit) employed for each learner unit; the size of the team and number of disciplines represented may vary
5. Appointment of unit leaders for each learner unit	5. Appointment of unit leaders for each learner unit	5. Appointment of unit leaders for each learner unit
6. Cooperative planning of instructional strategies by members of the instructional unit	6. Cooperative planning of instructional strategies by members of the instructional unit	6. Cooperative planning of instructional strategies by members of the instructional unit
7. Sharing instructional leadership responsibilities in each school through creation of an Instructional Improvement Committee (IIC)	7. Sharing instructional leadership responsibilities in each school through creation of an Instructional Improvement Committee (IIC)	7. Sharing instructional leadership responsibilities in each school through creation of an IIC: (a) Based within discipline or grade levels (Instructional Leadership Council) (b) For the school as a whole

(continued)

Table 1 (continued)

(A) Multiunit Elementary School Component (MUS-E)	(B) Possible Application of the MUS-E Component to the Multiunit Middle School	(C) Possible Application of the MUS-E Component to the Multiunit Senior High School
8. Variable instructional groupings	8. Variable instructional groupings	8. Variable instructional groupings
9. Individually guided education instructional approaches	9. Individually guided education instructional approaches	9. Individually guided education instructional approaches
10. Use of the Instructional Programing Model	10. Use of the Instructional Programing Model	10. Use of the Instructional Programing Model
11. Emphasis on behavioral objectives to be employed in all instructional activity	11. Emphasis on behavioral objectives to be employed in all instructional activity	11. Emphasis on behavioral objectives to be employed in all instructional activity
12. Use of criterion-referenced evaluation instruments	12. Use of criterion-referenced evaluation instruments	12. Use of criterion-referenced evaluation instruments

which is characteristic of MUS-E. Many high school seniors perceive themselves as being far more "sophisticated" than underclassmen, particularly freshmen or sophomores, and will fraternize with students of lesser class position only when special and unusual circumstances demand it. In other words, multigrade grouping approaches which are popular for learners at the elementary level may generate special problems at the senior high level. A variety of alternatives—multiage, cross-grade units within one discipline and cross-grade units within several disciplines—for formation of units were explored in the development of the secondary school models. Several models are imperative for multiunit secondary schools, rather than one, as is the case for MUS-E. At the senior high level, it may be necessary to confine cross-grade grouping to two grade levels, whereas at the middle school level cross-grade grouping of three or even four grade levels may be feasible.

2. The comprehensiveness of secondary school program offerings. The more diversified secondary school curriculum introduces an additional complicating factor not obvious from a review of the components shown in Table 1: Not only is there a great variety of offerings, but some are "required" (general education), others are optional or "electives," and still others carry special implications such as "vocational" courses. Student choice in selecting programs of study was not a factor in elementary schools. In addition, the use of the so-called "Carnegie units" for determining those ready for graduation from senior high schools may have to be modified, if not abandoned, to meet the individual needs of learners. Carnegie units were not a factor in MUS-E.

3. The role of the special subject area teacher in the multiunit school raises some key issues. At present, special elementary teachers of art, music, physical education, etc., are involved infrequently in unit meetings and, at best, represented informally in the Instructional Improvement Committee (IIC). Although the inability to involve formally and effectively all teachers may have caused only minor reactions in the elementary schools, the failure to do so at the secondary level could have very serious consequences.

There is some evidence of growing concern over the role of special elementary

teachers in the multiunit school, resulting in attempts to involve the special elementary teachers of art, music, physical education, etc., in unit meetings and in the IIC. In a truly comprehensive secondary school, most secondary teachers would not be represented if existing MUS-E models were followed. The number of teachers in elective courses could outnumber those in required courses. To summarize, an important new element in the MUS-S models will be the mechanism for involving so-called special teachers in the unit meeting and other instructional decision-making groups.

4. The organization of the "curriculum units" (C-units) at the secondary school level offers some unique challenges in the design of multiunit secondary school models. It could lead to more relevant programs by generating an alternative to the subject matter organization. Since the teacher in an elementary school with self-contained classrooms taught all of the basic subjects, few problems were encountered in using multidisciplinary approaches. This is not the case in most secondary schools where subject matter specializations by teachers tend to isolate them into separate "discipline" camps. In general, however, the MUS-E was not a means of reorganizing the elementary school curriculum, but rather a means of moving from group-oriented methods of instruction to individually guided instructional strategies.

5. There is a propensity to schedule (program) secondary school classes into time slots of fixed duration. This generates special concern as an instructional organizational factor not encountered in the more informally designed and executed elementary school "class" or study schedule.

6. The formation and deployment of instructional teams to create the "instructional unit" (I-unit) raises issues similar to those reviewed earlier in discussing how the "learner units" and "curriculum units" shall be formed. Teacher certification at the secondary school level follows subject matter lines to further intensify these concerns. The formation of teaching teams within a single discipline would present fewer problems in a multiunit secondary school than teams with representatives from a number of disciplines, that is, teams which are multidisciplinary in nature.

7. The range in size of secondary student enrollments may have an impact on the feasibility of operating in the multiunit school mode. Schools that are very small (fewer than 100 students) will present a different set of problems than the very large schools (2,000 or more). The typical elementary school enrolls about 500; secondary schools may have three, four, or five times that number. The IIC in the very large secondary schools may become cumbersome as the number of representatives exceeds 20.

8. The Wisconsin Research and Development Center does not have, at this time, any individualized curriculum packages designed for secondary school levels. An instructional organization pattern is a means. It demands the use of individualized instructional packages to operationalize the new system. Individualized instructional packages have been developed by some local school systems, but they seldom receive extensive field testing. Such "homegrown" packages may have to be used during the early years of IGE/MUS-S even though they lack the research and development base that now characterizes the Wisconsin Research and Development Center's elementary reading and math curriculum products as well as individually guided motivation.

Possible Solutions for IGE/MUS-S Models

Adapting other aspects of the IGE/MUS- to secondary schools may not be as simple one might assume from a hurried review of "Crosswalk" outlined in Table 1. Some positive suggestions are submitted as likely solutions to the problems raised:

1. The experience of secondary schools which claim to be nongraded, to use differentiated staffing, and to implement large-group and small-group instructional units can be applied to the problems at hand. In addition, there is much multiage grouping in music, art, agriculture, physical education, and similar fields in secondary

schools. Such practices may be modified and reorganized to generate feasible multiunit secondary school models. In short, previously developed schemes related to the formation of multiage (nongraded) learner units as well as differentiated staffing instructional units may be useful to the development of IGE/MUS-S models. There is no point in re-inventing the wheel; the MUS-S models will adapt and reflect other innovative practices that are consistent with individually guided education.

2. The "core curriculum" movement at the secondary school level which was popular during the 1940's and 1950's sought to break down the rigidities of the subject matter curriculum organization and its compartmentalization into unrelated disciplines. In "core" programs a single teacher sought to blend such subjects as English and history into a unified experience for a class of students during a two-hour block of time. Pupil-teacher planning was a part of the "core." There were no teacher teams, cooperative planning sessions among instructional specialists, or individually guided instructional techniques. Nonetheless, a few dimensions of the described "core" approach may provide clues for the creation of new "curriculum units" of a multidisciplinary nature. More than likely, these will be identified as part of a multidisciplinary general education program rather than a "core."

The curriculum unit in the MUS-E follows the subject matter curriculum organization. It is not necessary to reorganize the curriculum to implement the secondary multiunit school models, although subsequent experience may find it desirable to organize the curriculum on something other than strictly subject matter lines.

3. The use of "block scheduling" can facilitate the formation of learner, instructional, and curriculum units as well as the allocation of time during the school day for cooperative planning by unit members. The schedule can be programmed so that a cluster of teachers may have "classes" (better, instructional responsibilities) with the same group of 100 to 150 students. In other words, a given cluster of teachers may have the same "free" period to allow for cooperative instructional planning or better understanding of individual students. Computer-based scheduling techniques may be the key to greater freedom in arranging students for purposes of individualized, cross-discipline, and multiage grouping instruction.

4. Flexible modular scheduling for secondary schools now exists and may help break down the rigidities of other types of instructional programming (scheduling).

5. The school-within-a-school concept can be applied to overcome the problem of very large enrollments. Large attendance centers can be "broken down" into special "houses." This concept can be readily integrated into the multiunit design for large secondary schools.

III
Conceptual Framework for the Generation of Multiunit School Models at the Secondary Levels

The major purpose of this theoretical paper is to generate a set of models for the multiunit secondary school. Some approaches for staff development for IGE/MUS-S, field testing, and refinement of subsequent models will be described. The secondary models will have many common characteristics. One design objective will be to help create an instructional organization for a more humane school; that is, an institution that will foster an individual's growth and development as opposed to transmitting isolated facts within disciplines. The general dimensions of the common conceptual framework for a more humane school through the multiunit secondary school models may be defined as follows:

A. Operationally, the IGE/MUS-S will be designed to facilitate:

   1. Individually guided learning opportunities—including

      a. Learning opportunities related to the intellectual capabilities, growth patterns, and interest levels of learners. The key concept here is "pacing"—allowing each learner to progress at an individual rate from his present position to higher performance levels that are realistic in terms of his abilities and growth rates. Continuous progress policies are necessary for implementation of this type of learning system.

      b. Opportunities to experience or interact with a variety of media and stimuli to give free play to individual learning styles. The key concept in this perception of individualization is "flexibility" in learning styles.

      c. Consideration of learning as a social experience where an individual can learn from others as well as from his own pursuits. This point of view rejects the narrow interpretation of individualization as "learning in isolation," that is, where the learner is confined to solitary activities such as those calling for interaction with a machine (no matter how sophisticated) or with a piece of paper (no matter how clever and well organized the design) on a continuing basis.

   2. Implementation of an outcomes-oriented learning system based on rational sequencing of instructional activities. The "Instructional Programing Model" developed by the Research and Development Center helps to attain this objective by calling for

      a. Specification of measurable (performance) objectives for all learning tasks.

      b. Assessment of entry-level skills and knowledge of the learner.

      c. Determination of exit-level skills and understandings.

      d. Development and use of criterion-referenced evaluation instruments.

   This learning system could be identified as the "learning-by-objectives" approach. This type of approach would help to satisfy the accountability demands placed upon a school.

   3. Continuous progress policies.

4. Nongrading of learners.

5. Flexible instructional strategies based on variable grouping patterns (individual, small, large, etc.) for learners and appropriate clustering of specialized teaching and related talents into instructional teams.

6. Broader sharing of the instructional leadership responsibilities in a building.

B. Structurally, there will be created within each of the multiunit secondary models a set of interrelated units for grouping learners, deploying instructional resources, organizing the learning experiences or curriculum, and facilitating instructional decisions. Again, the structure seeks to create a more humane learning environment.

The two basic organizational components or modules to facilitate individually guided education will be the "Individually-Guided Inter-Disciplinary Mod" (IGID) and the "Enrichment Mod" (E). In general, these two basic structural components of the operational model are defined as follows:

1. The "IGID Mod"—"Individually-Guided Inter-Disciplinary Module"—is the organizational component which includes required or general learning experiences. These experiences may cross the lines of several disciplines, and are based on individually guided learning approaches. The "IGID Mod" is closely related to the basic organizational or instructional unit for the multiunit elementary school.

2. The "E Mod"—"Enrichment Module"—is the second major organizational component. It encompasses all optional learning tasks or "disciplines," that is, those specialized experiences not required of all students at a given point in development. This component has not been well developed to date in the MUS-E.

The structural aspects of the individual learner-oriented multiunit secondary school models may be described in greater detail from other vantage points:

1. From the learner level (the "learner-unit level" or "L-unit") the models may be seen as ways of:

a. Forming a variety of flexible learning groups (75 to 150 per unit) of varying duration which are of larger size than the traditional classroom with 25 to 30 pupils. The learner unit is the basic learner module. It should not be misinterpreted as the number of pupils to be instructed by a single teacher. Clusters of 75 to 150 pupils facilitate multiage grouping (cross-grading). Not all learners of the same chronological age are at the same stage of intellectual development or maturity. The number of the learners inside a unit gives the teaching team the flexibility to group learners with similar interests, maturity, and ability or with similar learning problems into clusters of varying size to facilitate instruction. (Again, individualization, in the sense of pacing and satisfying different learning styles, does not dictate a one pupil/one teacher relationship at all times.) Furthermore, the L-unit should not be perceived as a long-lasting and inflexible homogeneous grouping. It is a group based on the learners' needs at the moment. The size and types of groups are transitory.

b. The learner gaining opportunities for multidisciplinary study.

c. Organizing larger blocks of time—two or more periods of about two hours each—for unified instructional activities or learning experiences; the time frame is structured in a unique manner to permit extended learning opportunities.

2. From the teacher level (the "instructional-unit level" or "I-unit") the models can be seen as ways of:

a. Organizing clusters of three or four teaching-learning specialists plus a set of support personnel to form a team called the instructional unit (I-unit). This basic instructional module is created to stimulate interaction among instructional team members, facilitate communication links among subject matter specialists, and maximize learning outcomes for pupils.

b. Forming flexible learner grouping patterns—small groups, large groups, and individual study opportunities.

c. Sharing instructional leadership responsibilities among teaching team members and the unit leader appointed by the principal.

d. Allocating time during the school day for members of the instructional unit to engage in cooperative planning of instructional strategies. This is important for improving effectiveness and thereby pupil learning. Teaming of teacher talents may be more important at the secondary school level to break down the rigidities of the grade-discipline fixation than it was at the elementary level.

e. Retesting on a daily basis a learning schedule (time allotted for acquisition of learning skills, knowledge, or attitudes) to meet the needs of individuals.

3. From the attendance center level (building) the models may be perceived as ways of:

a. Sharing instructional leadership responsibilities among unit leaders and the principal as well as among all team members and the unit leader to create a more humane learning environment. The primary mechanisms for unit leader/principal instructional decision-making involvement and sharing are the Instructional Improvement Committee (IIC) and the Instructional Leadership Council (ILC). The unit meeting is the vehicle for involving staff members in instructional leadership.

b. Creating special organizational arrangements to cope with the very large secondary schools (those with enrollments of 1,200 or more). The mechanism to accomplish this can be the school-within-the-school concept. An Instructional Leadership Council would be organized for each school-within-a-school. The ILC for each house would comprise the IIC for the school.

c. Developing a set of organizational modules composed of unified groups of learners, instructional specialists, and learning opportunities. The school is conceptualized as a cluster of learners seeking ways to satisfy educational needs and maximize personal growth opportunities with and through a group of instructional specialists. This conceives of a school as a humane and relevant institution which focuses on learners rather than subject matter or convenience of administration.

d. Organizing flexible (or modular) instructional scheduling programs to satisfy the time demands of the "IGID Mods" or "E Mods."

To summarize, the multiunit secondary school models are related to a set of human learning needs; that is, to a conception of the school as a more humane learning environment. Each model has an operational and structural dimension serving as the means to a more humane institution. The purpose is to enhance learning by organizing the instructional resources within an attendance center or building in a more effective and efficient manner. The various modules within the model are designed to facilitate learning procedures which are consistent with individually guided education and which give due recognition to other important factors in the learner's environment. The term "multiunit" suggests that a variety of units are formed. Thus, at the building unit level, certain instructional decision-making vehicles are created. "Curriculum units" are created to facilitate the clustering of learning experiences. "Instructional units" (teams) of teaching specialists and teaching support personnel are formed to maximize the effectiveness of individual instructors as teaching-learning specialists. "Learner units" are established to promote the kinds of flexible groupings that will satisfy learner needs. In short, the models generated focus on individual learning capabilities and styles, outcomes-oriented learning systems, and flexible strategies for stimulating learning.

IV
More Detailed Description of Operational Multiunit Secondary School Models

The MUS model is a general guide to action. A number of operational problems are encountered in trying to make the model work in the "real world." One of the important "details" in a feasible instructional organization model is the organization of the "Individually-Guided Inter-Disciplinary Module" or the "IGID Mod." This is a major operational dimension, and can be called the heart of the instructional model. A number of options are possible in the formation of such basic structural units, each option depending on the number of disciplines to be included within the mod. In addition, this basic organizational module influences the composition of the teaching teams, or instructional units. Each option has a number of individual suboptions based on the formation of cross-grade (multiage) learner units.

Elements of four different types of IGID Modules are summarized in Table 2. To illustrate, Option A describes an IGID Module which includes six disciplines and a 1 x 6 number of teacher specialists. It is identified as the "Super Maxi IGID Mod," for a maximum number of separate disciplines are interrelated within a single instructional unit. The "Super Maxi Mod" would have an instructional team with representative teachers from each of six different disciplines, a "Six-D" team. It would allow the allocation of a six-period (hour) block of time. Approximately 200 pupils would be assigned to this module. This variation of the basic IGE/MUS-S model may be suited best for middle and junior high schools where math, science, English, social studies, and two other disciplines may be "required." It is less applicable at the tenth- and eleventh-grade levels because not all these disciplines constitute a required core at such levels.

Option B is based on a four-discipline IGID Mod. It is called the "Maxi-Mod," and includes the four disciplines of math, science, English, and social studies, those most likely to be included in the interdisciplinary mod. Again, there would be at least one teacher for each of the four disciplines on the "instructional team" for the unit. A four-period block of time (rather than six) would be spent by 150 students under the guidance of the Maxi IGID team.

Option C is called the "Mini IGID Mod," for only two disciplines are blended or interrelated. Either two-person teams or, better yet, four-person teams (two from each discipline) would be created. Only a two-period block would be used for the 150 pupils in this unit. It may be applicable in the last two years of senior high school.

It may be stretching things a bit to suggest that a single discipline, called the "Mini-Mini IGID Mod," could be called an "interdisciplinary" unit. It is presented as Option D. Teachers from the same discipline form a team to cooperatively plan instructional strategies. They would not have the advantage of interaction with teachers from other disciplines. The cross-discipline approach permits the allocation of large blocks of time for the module; this is lacking in Option D. The "Mini-Mini IGID Mod" is, at best, a small departure from traditional patterns.

Scheduling alternatives are presented for each option in Figure 1. A schedule for a six-period day is shown, but other types of schedules based on five, seven, or eight periods can be developed as well. Note that time is allocated during the school day for the unit meeting. Another scheduling variation is shown in Figure 2.

Iconic Models of Multiunit Secondary Schools

A model by definition is a representation of reality. An iconic model, again by definition, is a pictorial representation of reality.

Table 2
IGID Mod Options for Multiunit Secondary School Models
Elements Used in the Formation of Individually-Guided Inter-Disciplinary (IGID) Modules

	Option A The Super Maxi IGID Mod	Option B The Maxi IGID Mod	Option C The Mini IGID Mod	Option D The Mini-Mini IGID Mod
A. Individually-Guided Inter-Disciplinary Module (IGID Module) Alternatives	1. 1 x 6 IGID Mod Six-Discipline Unit English, Social Studies, Math, Science, Music, Art	1. 1 x 4 IGID Mod Four-Discipline Unit English, Social Studies, Math, Science	1. 2 x 2 IGID Mod Two-Discipline Unit a. English, Social Studies b. Math, Science c. Fine Arts (Art, Music)	1. One IGID Mod Single Discipline
	2. Six-D(iscipline) Teacher Team—One person from each; Cross-Discipline Teaming plus aides and interns	2. Four-D(iscipline) Teacher Team—One person from each; Cross-Discipline Teaming plus aides and interns	2. Two-D(iscipline) Teacher Team—Four-person teams with two from each discipline	2. One-D(iscipline) Teacher Team—Three professionals per team
	3. Six-period (hour) block of time for the Super Maxi Mod	3. Four-period block of time for the Maxi Mod	3. Two-period block of time for each Mini IGID Mod	3. One-hour period daily or one five-period block per week
	4. 200 pupils/SMxIGID[a] Mod	4. 150 pupils/MxIGID[b] Mod	4. 150 pupils/MnIGID[c] Mod	4. 120 pupils/S-IGID[d] Mod
	5. Two options: a. Three pupil levels Cross-Grade—Cross-Discipline Units b. Single-Grade—Cross-Discipline	5. Two options: a. Three pupil levels Cross-Grade—Cross-Discipline Units b. Single-Grade—Cross-Discipline	5. Two options: a. Three pupil levels Cross-Grade—Cross-Discipline Units b. Single-Grade—Cross-Discipline	5. Two options: a. Cross-Grade—Single-Discipline b. Single-Grade—Single-Discipline
	6. Team members have same planning period	6. Team members have same planning period	6. Team members have same planning period	6. A cluster of teachers, from several disciplines but with the same group of students, have the same planning period

Table 2 (continued)

	Option A The Super Maxi IGID Mod	Option B The Maxi IGID Mod	Option C The Mini IGID Mod	Option D The Mini-Mini IGID Mod
B. Enrichment Module (E Module) Alternatives	1. Physical Education	1. Physical Education	1. Physical Education	1. Physical Education
	2. Home Economics	2. Music	2. Music	2. Music
	3. Industrial Arts	3. Art	3. Art	3. Art
	4. Others	4. Home Economics	4. Home Economics	4. Home Economics
		5. Industrial Arts	5. Industrial Arts	5. Industrial Arts
		6. Others	6. Others	6. Others

[a]SMxIGID means "Super Maxi IGID"

[b]MxIGID means "Maxi IGID"

[c]MnIGID means "Mini IGID"

[d]S-IGID means "Single IGID"

Option A
Super Maxi IGID Mod

Scheduling Alternatives

Periods	A	B
1	Super	E Mod Block
2	Maxi	Super
3	IGID	Maxi
4		
5	Mod	IGID
6	Block	Mod
7	E Mod Block	Block

Option B
Maxi IGID Mod

Scheduling Alternatives

Periods	X	Y	Z
1	Maxi	Enrichment Mod Block	Enrichment Mod Block
2	IGID	Maxi	
3	Mod	IGID	Maxi
4	Block	Mod	IGID
5	Enrichment Mod Block	Block	Mod
6		Enrichment Mod Block	Block
(One hour each)			
Unit Meeting Period	5	6	1

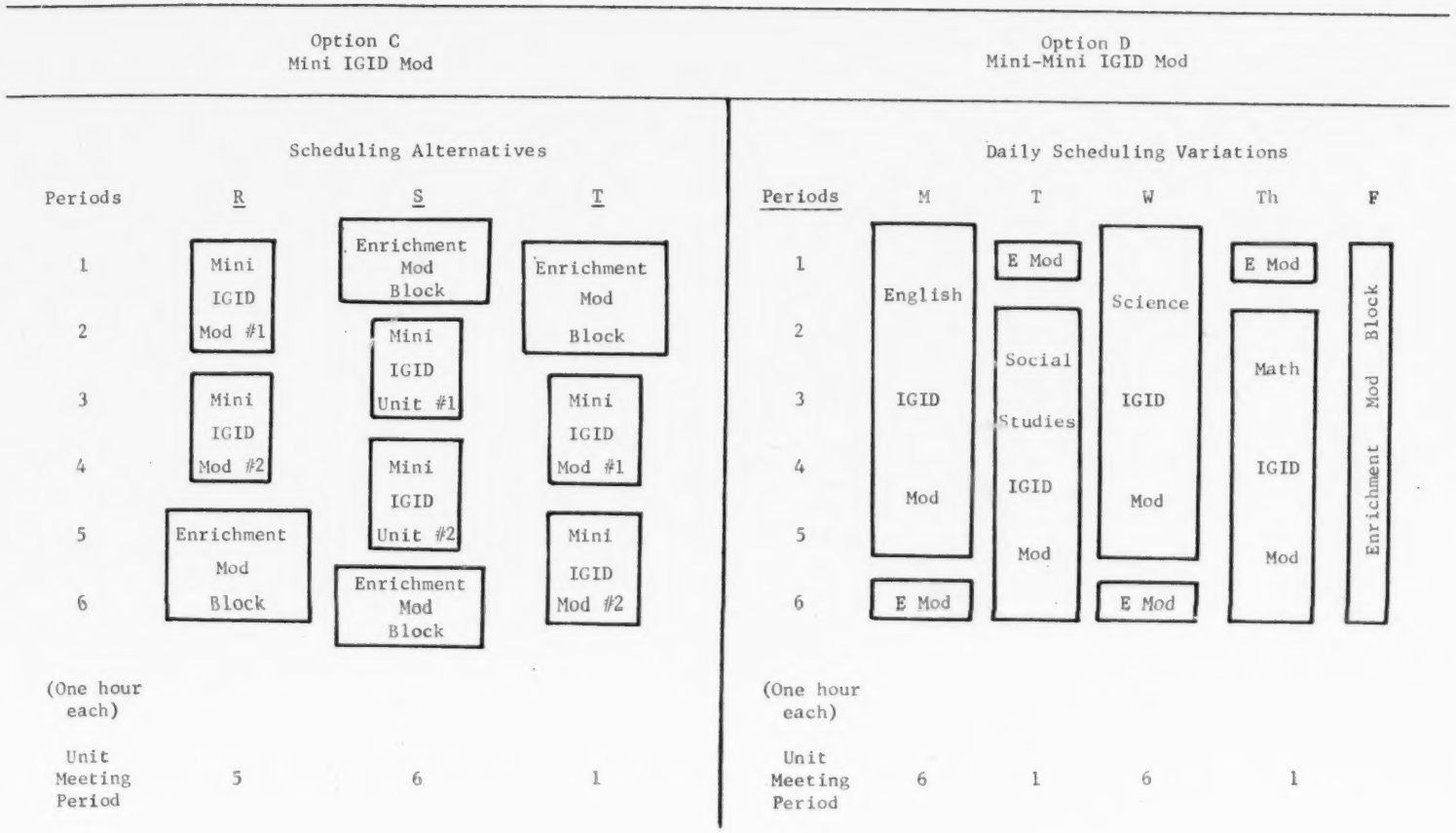

Fig. 1. Scheduling alternatives for multiunit secondary school models.

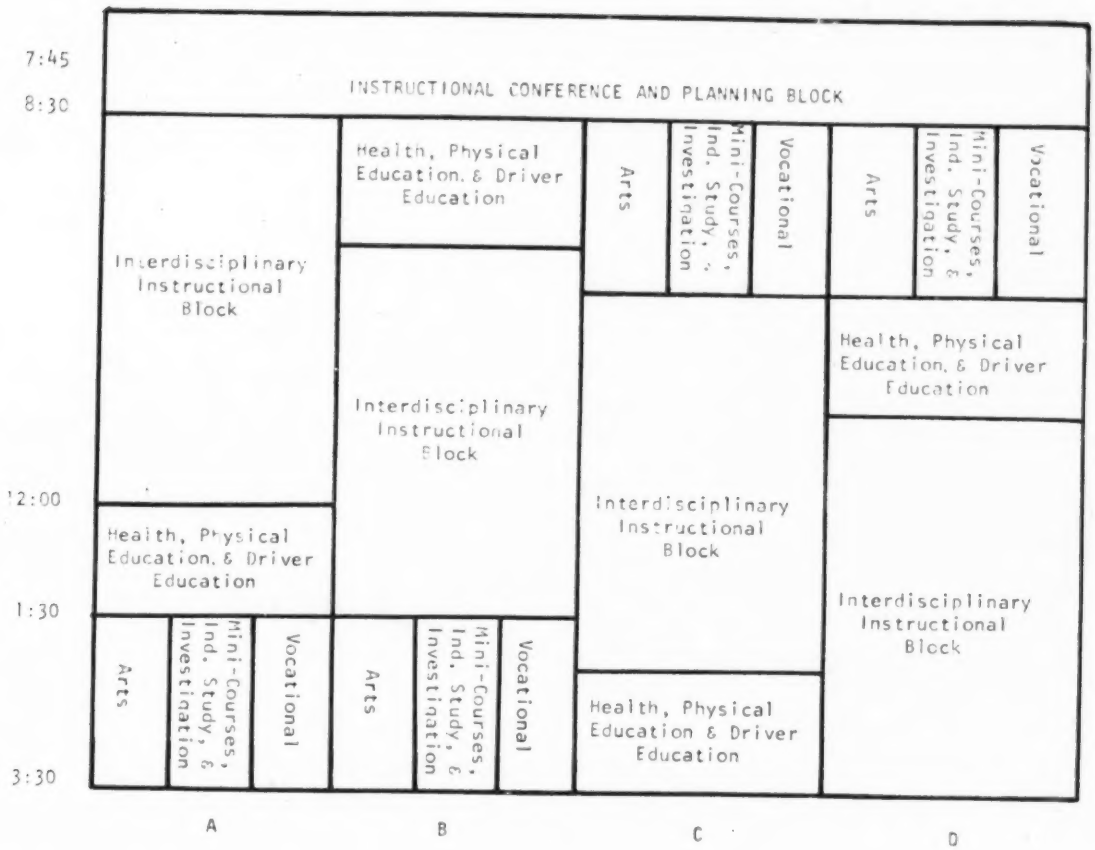

Fig. 2. General time schedule for multiunit secondary schools.

Although iconic models lack the heuristic qualities of mathematical models, they are useful in describing and illustrating the issues under study. The pictorial representations of the IGE/MUS-S are presented to facilitate communication of the essential elements in the models and the relationships among them.

The verbal models of the IGE/MUS-S described in previous sections identified three major units—the learner unit (L-unit), the instructional unit (I-unit), and the curriculum unit (C-unit)—the decision unit (D-unit) is described below. The "Individually-Guided Inter-Disciplinary Module" or IGID Module is generated by clustering the above separate elements or units. In other words, IGID = L-unit + I-unit + C-unit + D-unit. This is shown in Figure 3 in the form of a pictorial representation of the IGID as <u>one</u> of the basic organizational modules of the IGE/MUS-S.

Only the IGID Module is pictured in Figure 3, and no reference is made to the enrichment experiences, the E Modules, that are so important in today's comprehensive secondary school. This is why it is called a first-generation model. Its value lies in outlining how an instructional model is put together and how the various components are related to each other.

The unit leader is designated as the responsible person for the operation of the total IGID Module, and is the instructional leader of the L-unit, I-unit, and C-unit. Important instructional decisions are made at the unit level—hence its designation as the decision unit (D-unit). It should not be inferred that the unit leader makes all decisions; instructional decisions are shared by all unit members. The D-unit level is part of the built-in accountability structure for the

organizational module. As the name implies, the unit leader provides leadership and coordinates the functioning of pupils in the L-unit, teachers and aides in the I-unit, and learning experiences in the C-unit. The iconic model projects the image of the I-unit as the "bridge" between the L-unit and C-unit, that is, the connecting mechanism between the students and the concepts or skills to be learned. In this sense, the unit leader is the "captain of the bridge," relying heavily on other members for the effective and efficient operation of the total unit.

A second-generation IGE/MUS-S iconic model is designated for the comprehensive secondary school. It fills the void of the MUS-E model by involving the special teachers in unit meetings and in the IIC as will be shown later. There is a close working relationship between the two basic organizational modules of the IGE/MUS-S, namely, the E Module and the IGID Module. Two pictorial versions of this more complete model are shown in Figures 4 and 5.

The second-generation IGE/MUS-S model attempts to relate the general education or required learning experiences in a secondary school to the optional or elective subjects. Within a total unit, there are two instructional teams and two unit leaders—one for the IGID Mod and a second for the E Mod. This assures representation of all teachers, those from elective as well as required courses, in unit meetings, the ILC, and the IIC. The curriculum unit is likewise pictured in two separate but interrelated portions—major responsibility for one curricular segment is fixed within the IGID Module and for the second within the E Module. In short, $C = C_{ID} + C_E$; that is, the total curriculum of the school includes the experiences offered in the "ID" or interdisciplinary unit and the "E" or enrichment unit.

The second-generation model is a radical departure from the IGE/multiunit elementary school model which is organized in a manner very similar to the first-generation IGE/MUS-S model. It is at the unit-leader level, that is,

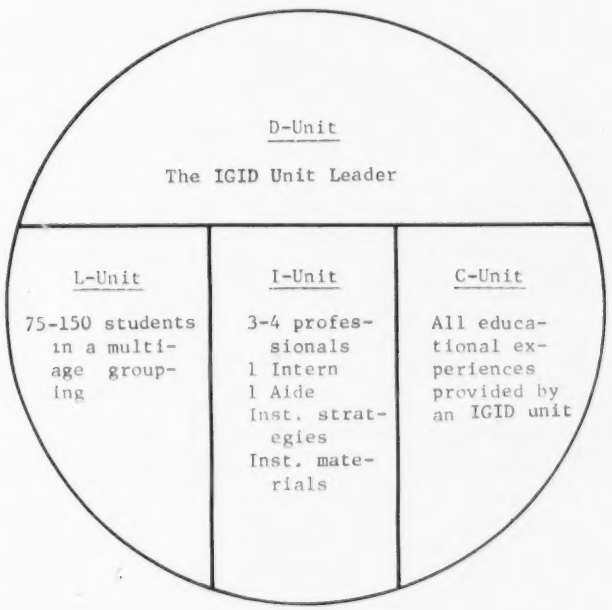

Fig. 3. The fundamental instructional unit: First-generation IGE/MUS-S model.

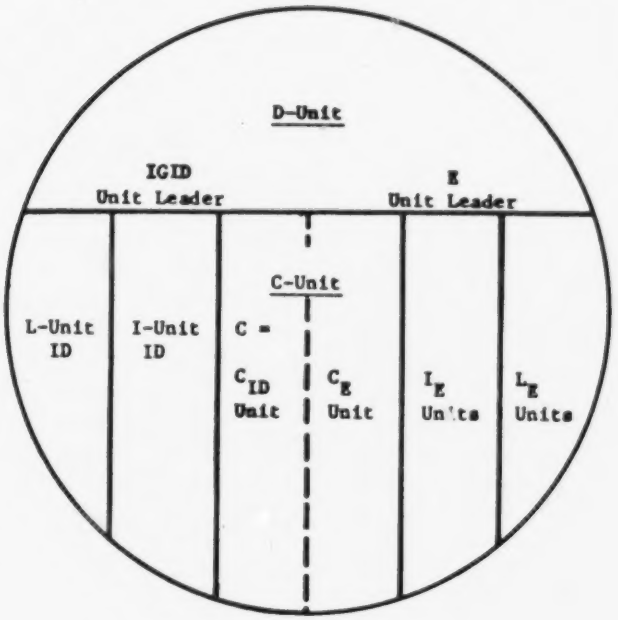

Fig. 4. The fundamental instructional unit: Second-generation IGE/MUS-S model—the unified version.

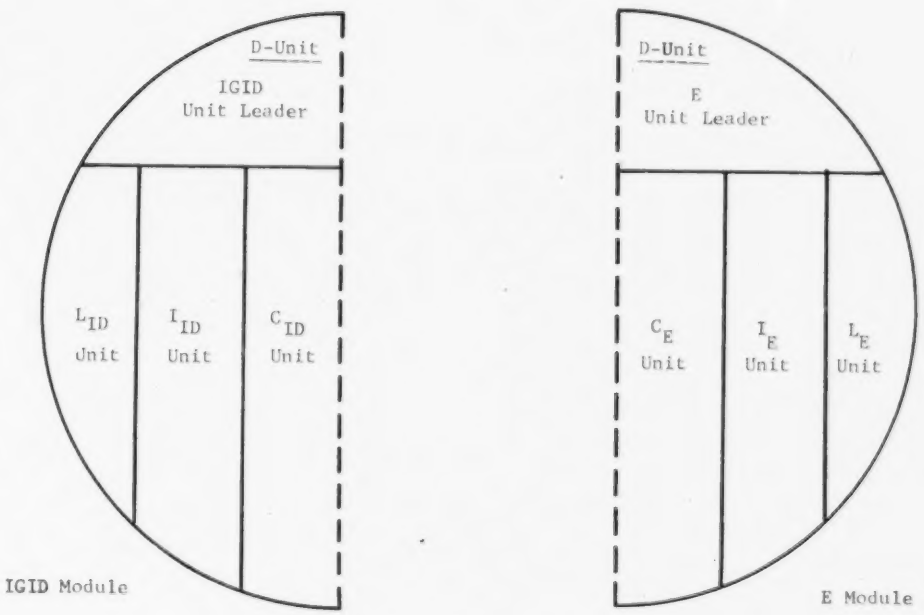

Fig. 5. The fundamental instructional unit: Second-generation IGE/MUS-S model—the split version.

GPO 801-172-4

at the decision level, where interaction between the IGID Module and E Module occurs to better relate and unify the experiences available to the learner. Hopefully, the unit meetings in the IGID Module will be mindful of experiences offered and decisions made with reference to the same individual or group of learners in the E Module and vice versa. This should result in greater participation of instructional specialists from elective or optional subjects in instructional improvement. Individually guided educational (IGE) strategies are applicable and can be pursued by instructional specialists in the E Module as well.

The title "modular instructional organization" can be used to identify the second-generation IGE/MUS-S model. The total school may be perceived as a cluster of interactive IGID and E organizational modules which focus on the total needs of the learner. In other words, a school is composed of a number of instructional modules to produce a more humane learning environment.

With 150 to 200 learners and three to six teachers in each fundamental instructional unit, it is important that the units be unified. A special mechanism is designed to maximize the interrelation of individual instructional units (the IGID Module plus the E Module). It is the ILC or "Instructional Leadership Council" for a school, or house within a school. It includes unit leaders from each IGID Module and E Module plus the principal. Student and community representatives may be included on the ILC where desired. Again, this is a substantial modification from the IIC configuration for the IGE/MUS-E. Where very large enrollments prevail there is a danger that the ILC will become too large. An iconic model of a comprehensive multiunit secondary school showing how the fundamental instructional units (IGID Mods plus E Mods) are related and unified through the mechanism of the ILC is shown in Figure 6.

Another iconic IGE/MUS-S model is shown in Figure 7, with more detailed data on the instructional unit (similar to the IGID Mods and E Mods). The term "instructional cabinet" is used instead of ILC, and is composed of unit chairmen (leaders) and the principal. "Elective areas" rather than "enrichment subjects" are identified as well. The terminology and the diagramming are different but the concepts presented in Figures 6 and 7 are similar.

V
Summary

The multiunit secondary school may be perceived as a modular instructional organization designed to facilitate the implementation of Individually Guided Education (IGE) concepts and operations. The school is composed of a cluster of fundamental instructional units each serving 150 to 200 learners. Each fundamental instructional unit has an IGID Module and an E Module. Each IGID Module and E Module includes the following components:

1. The learner unit (L-unit)—a set of about 75 to 150 learners.

2. The instructional unit (I-unit)—a set of instructional team members, strategies, and materials seeking to promote individualization of learning. The instructional team includes three to four professionals, an aide, and an intern. It is the bridge between the L-unit and the C-unit.

3. The curriculum unit (C-unit)—a set of learning experiences offered by the institution. To increase relevance, a multidisciplinary approach to problem solving is recommended. The number of disciplines included in the curriculum unit may vary with the situation encountered. The "required" curriculum is part of the IGID Mod. The enrichment, or elective, experiences are part of the E Mod.

4. The decision unit (D-unit)—a set of professional leaders working cooperatively to improve instruction at the unit level and at the school level. Two mechanisms for decision-making, the ILC (Instructional Leadership Council) and the IIC (Instructional Improvement Committee), may be necessary in large secondary schools to unify the efforts of each mod as well as the total fundamental instructional units.

The secondary school models are called multiunit patterns not simply because there are a number of IGID and E Mods but because of the many unit components for learners, for instruction, for curriculum, and for decision-making. Each IGID or E Module is equal to the sum of L (learner unit), I (instructional unit), C (curriculum unit), and D (decision unit); that is, IGID = LICD and likewise E = LICD. This suggests that for a school to function there must be learners (clustered in a particular way), instructional resources (human and material), experiences to be learned (substantive knowledge or skills), and a "central nervous system" or decision-making unit to regulate the flow of people, ideas, and resources. The integrating concept for the modular instructional organization is Individually Guided Education (IGE).

To summarize, the IGID Mod encompasses the required learning experiences of a school. It may interrelate two, four, or six different disciplines within the module. The optional experiences are grouped into what is called the "Enrichment Module" or E Module. There is an E Mod for each optional learning experience. Here, too, IGE is to be practiced. The IGE/MUS-S models generated give representation on the IIC and ILC to all teachers, not just those in the IGID Module. This represents one of the unique developments in the IGE/MUS-S models.

A large school may be subdivided into houses for purposes of administration and operation. The following general formula applies:

$$1 \text{ School} = X \text{ Houses} = Z \cdot \text{IGID's} + Y \cdot \text{E's}$$
$$= Z(L_{ID} + I_{ID} + C_{ID} + D_{ID}) + Y(L_E + I_E + C_E + D_E)$$

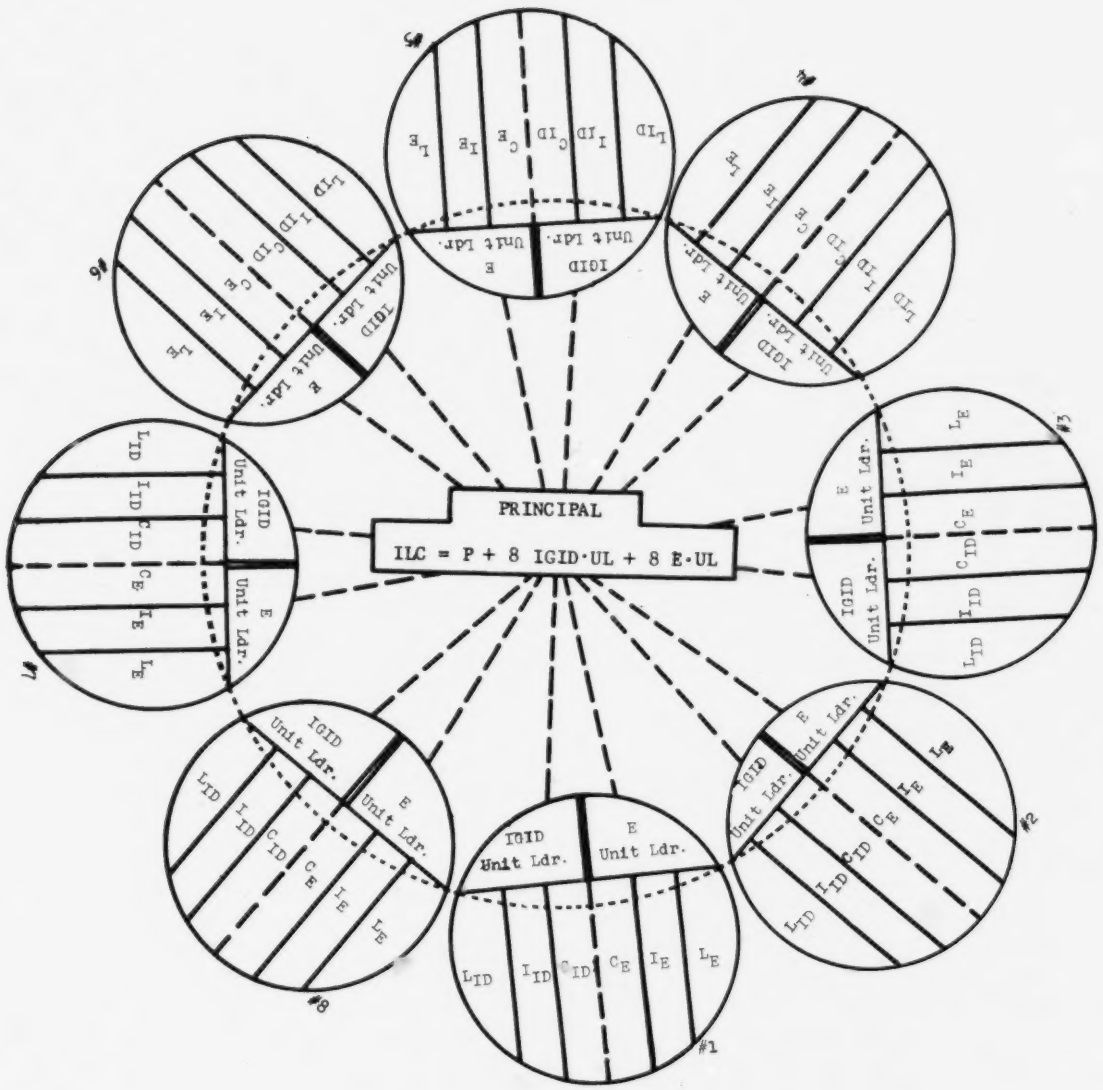

Fig. 6. Iconic model of a comprehensive multiunit secondary school, showing the relationships among eight fundamental instructional units and the ILC.

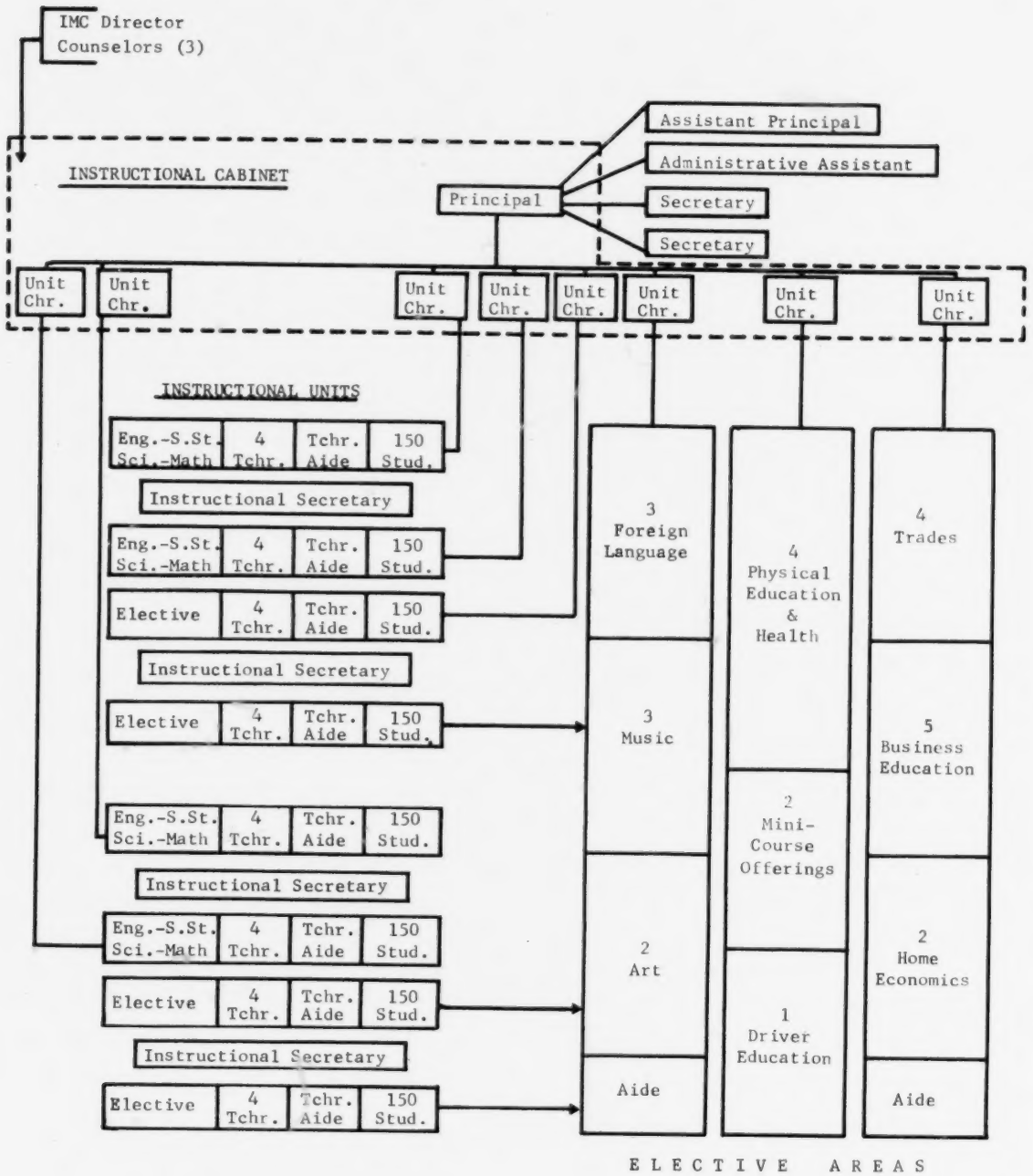

Fig. 7. Organizational chart for a comprehensive multiunit secondary school.

Let it be assumed that 1,200 pupils justify the formation of one house and that 150 pupils are in one IGID Mod (8 IGID's per house). The number of E Modules would vary with the comprehensiveness of the program. A 2,400-pupil secondary school would be shown to have:

1 School = 2 Houses = 16 IGID's + Y·E's
= 16 IGID learner units
+ 16 IGID instructional units
+ 4 sets of IGID curriculum units
+ 16 IGID Unit Leaders
+ X·E learner units
+ X·E instructional units
+ Y sets of E curriculum units
+ Y·E Unit Leaders
+ 2 ILC's
+ 1 IIC

One ILC, or Instructional Leadership Council, is designed for each house. The IIC is the collection of ILC's, so that in this particular case:

1 IIC = 2 ILC; and
1 ILC = 8 IGID·UL (Unit Leaders)
+ Y·E·UL + 1 P; then,
1 IIC = 2 ILC = 16 IGID·UL + 2Y·E·UL +
+ 2P + 1D (Director for the entire building) + X·S (X number of central office staff, if desired)

A variety of IGE/MUS-S models are possible in the small- and large-scale field testing. The key variable for each version is the basis used for forming learner units. Learners may be clustered on the basis of disciplines included in the IGID Module or by age and grade levels of students. In addition, the models may be based on the type of secondary school. To summarize, the possible IGE/secondary school operational models are:

The J Models (for secondary schools presently operating as traditional two- or three-grade junior high schools)

Option J1—Formation of learner units based on multiage, cross-grade-level, multidiscipline clustering
Option J2—Formation of learner units based on single-discipline, single-grade-level clustering
Option J3—Formation of learner units based on multidiscipline, single-grade-level clustering
Option J4—Formation of learner units based on multidiscipline, multigrade-level clustering

The M Models (for secondary schools presently operating as two- or three-grade middle schools)

Option M1—Formation of learner units based on multiage, cross-grade-level, multidiscipline clustering
Option M2—Formation of learner units based on single-discipline, single-grade-level clustering
Option M3—Formation of learner units based on multidiscipline, single-grade-level clustering
Option M4—Formation of learner units based on multidiscipline, multigrade-level clustering

The S Models (for secondary schools presently operating as three- or four-grade senior high schools)

Option S1—Formation of learner units based on multiage, cross-grade-level, multidiscipline clustering
Option S2—Formation of learner units based on single-discipline, single-grade-level clustering
Option S3—Formation of learner units based on multidiscipline, single-grade-level clustering
Option S4—Formation of learner units based on multidiscipline, multi-grade-level clustering

The options available to district administrations and secondary schools seeking to be considered as pilot centers are:

1. Selecting a single basis to be used for forming learner and instructional units. This would call for the selection of one of the models described above; that is, J1, J2, J3, J4; M1, M2, M3, M4; S1, S2, S3, S4.
2. Selecting the type of scheduling pre-

ferred by the secondary school (modular, traditional, etc.).

3. Determining whether one or more IGE/MUS-S learner and instruction units will be formed within the school.
4. Determining what number and types of teachers and other staff within the district will participate in pilot center operations.
5. Determining when the secondary school teachers will participate in a staff development workshop.
6. Determining the type, date, and length of preopening school workshop to be held within the district.
7. Determining whether one or more pilot centers will be operational within the school district.

GPO 801-172-3

VI
IGE/MUS-S Staff Development Strategies and Materials

The importance of staff development to the implementation of R & D Center projects has been described in other Center publications and will not be repeated in detail herein. The pilot center staff development programs scheduled for late fall or winter of the 1972-73 school year will enable the personnel to acquire the instructional (professional), managerial, and human relations competencies needed to operate in the multiunit secondary school mode.

The staff development workshops should help teachers to acquire skills in the following areas:

1. Identifying and writing performance objectives.
2. Diagnosing learning problems of secondary school learners.
3. Designing individualized learning strategies for secondary school learners.
4. Understanding the basic concepts and gaining professional skills in the implementation of the Instructional Programing Model.
5. Designing, using, and interpreting criterion-referenced evaluation instruments.
6. Developing skills in cooperative planning with professional and paraprofessional staff members.
7. Designing and implementing individualized instructional systems.
8. Using individual, small-group, and large-group instructional strategies.

A set of pilot schools will be used to test and further refine the IGE/MUS-S models and IGE/MUS-S staff development strategies and materials.

Appendix

Glossary of Acronyms and Terms Used in Generating Models for Individually Guided Education in a Multiunit Secondary School

$C = C_{ID} + C_E$ — A symbolic representation of the fact that the total school curriculum (C) is equal to the IGID Mod (C_{ID}) plus the curricular offerings in the E Mod (C_E).

C_E — A symbol used to designate that portion of the total curriculum (learning experiences under the control of the school) included within and available to learners within the "Enrichment Module" (E Mod).

C_{ID} — A symbol used to designate that portion of the total curriculum (learning experiences under the control of the school) included within and available to learners within the "Individually-Guided Inter-Disciplinary Module" (IGID Mod).

Continuous Progress — A no-failure policy where the traditional grade-standards approach followed in determining whether a learner is "promoted" is abandoned in favor of allowing each learner to progress according to his own ability to learn, that is, in a continuous fashion. It is a policy based on performance objectives and criterion-referenced assessment which render unnecessary the designation of grades and the traditional concept of school "promotion."

Cooperative Instructional Planning or Cooperative Planning — An approach to the planning and development of instructional strategies for an individual learner and for groups of learners that calls for frequent and regular deliberation by two or more instructional specialists (teachers) and others concerned with the student(s).

Criterion-Referenced Assessment or Criterion-Referenced Evaluation — An approach to the appraisal and/or measurement of a learner's achievement level with reference to a specific performance objective. This is often contrasted with norm-referenced learner appraisal based on test instruments having measures related to expected grade-level achievements rather than specific learning performance objectives.

Cross-Grade Groupings — Grouping or clustering of students into units of two or more so-called "grades" or levels.

C-Units — A partial acronym or abbreviation used to identify the so-called "curriculum unit" of the multiunit school. It includes all the learning experiences available in the school in the IGID Mod and the E Mod.

Decision Units — The level of a modular instructional pattern such as an IGID Mod and an E Mod at which important instructional decisions are made by the unit leader and team members of the mod or unit. The unit leader is the coordinator of the mod or unit team members and is placed at the decision-unit level of a mod. This is the coordinating level of the IGID Mod and the E Mod where the L-unit, I-unit, and C-unit (defined elsewhere in this glossary) concerns are brought together and resolved to achieve instructional objectives.

Differentiated Staffing — A system of deploying instructional staff members into clusters or teams within which a hierarchy is established based on differentiated or specialized instructional roles. A team leader and regular staff comprise the team which may include aides and interns as well.

D-Units — A partial acronym used to identify the "decision-unit" portion of either an IGID Mod or an E Mod.

E Mod or E Module — A partial acronym for the "Enrichment Module" of a multiunit secondary school.

Enrichment Mod or Enrichment Module — One of the two basic instructional organization modules within the comprehensive multiunit secondary school formed to organize all the specialized experiences not required of all students at a given time. Within this category are all the optional, elective, or nonrequir d learning tasks or disciplines. Each module includes a learner unit, instructional unit, curriculum unit, and decision unit working together.

I & R Units — An acronym for Instruction and Research Units, which are the organizational units in the IGE/multiunit elementary schools.

Iconic Model — A special type of model in which the essential elements of a conceptual framework are presented as a pictorial representation of reality. Thus, a blueprint is an iconic model of a school building. A diagram or flow chart which identifies the major dimensions of a model and outlines the relationship among these dimensions may also be classed as an iconic model.

IGE — An acronym for Individually Guided Education, which is defined elsewhere in this glossary.

IGE/Multiunit Elementary School — A partial acronym used to identify a multiunit elementary school in which individually guided education is an integral part of the instructional program. It is characterized by an instructional organization pattern that is unique to multiunit schools. As a general term, it may include Grades K-6 or K-8 organized as a primary, intermediate, or complete elementary school.

IGE/Multiunit Secondary School — A partial acronym used to identify a multiunit secondary school in which individually guided education is an integral part of the instructional program. It is characterized by an instructional organization pattern that is unique to multiunit schools. As a general term, it includes Grades 5-12 organized as a middle, junior high, or senior high school.

IGE/MUS-E — An acronym used to identify a mul iunit elementary school where individually guided education is an integral part of the instructional program. It is characterized by an instructional organization pattern that is unique to multiunit schools. A literal translation of the acronym is: Individually Guided Education in the Multiunit School-Elementary. The acronym is a substitute for IGE/M 'tiunit Elementary School, defined above. As

a general term, it includes Grades K-6 or K-8 organized as primary, intermediate, or complete elementary schools.

IGE/MUS-S — An acronym used to identify a multiunit secondary school where individually guided education is an integral part of the instructional program. It is characterized by an instructional organization pattern that is unique to multiunit schools. A literal translation of the acronym is: Individually Guided Education in the Multiunit School - Secondary. The acronym is a substitute for IGE/Multiunit Secondary School, defined above. As a general term, it includes Grades 5-12 organized as a middle, junior high, or senior high school.

IGID or IGID Mod — An acronym used to describe the "Individually-Guided Inter-Disciplinary Module" of the IGE/Multiunit Secondary School.

IIC — An acronym for the Instructional Improvement Committee, which is defined elsewhere in this glossary.

ILC — An acronym for the Instructional Leadership Council, which is defined elsewhere in this glossary.

Individualized Curriculum Packages or Individualized Learning Packages — Learning content, activities, and exercises for various subjects, courses, or other experiences that are organized for self-instructive, individually-guided, or small-group purposes. The specific package may be either the basic or a supplementary instructional approach. The term stands in contrast to more traditional group-oriented learning materials and procedures. The packages usually organize skills and concepts to be learned around performance objectives.

Individually Guided Education — Referred to as IGE, it is an approach to learning conceived, developed, and tested at the Wisconsin Research and Development Center for Cognitive Learning which seeks maximum flexibility in the individualization of learning rates and styles. It is based on individualization in its broadest sense where the individual learner can profit from participation in a tutorial setting (one pupil and one teacher), in small-group settings, and in large-group modes, as well as in solitary pursuits where the learner reads by himself, interacts with a learning machine, or solves problems by himself. Learning situations are varied, instructional personnel are deployed in various patterns, and materials to be learned are designed to satisfy the individual's learning styles and rates. The facilitative organizational environment for individually guided education is the multiunit school.

Individually-Guided Inter-Disciplinary Mod or Module — The basic instructional organizational module of the multiunit secondary school. Within this module are all the required or general learning experiences which may cross the lines of several disciplines. It is similar to the I and R unit of MUS-E.

Instructional Improvement Committee — Often referred to as the IIC, the Instructional Improvement Committee is an important mechanism within the multiunit school for the sharing of instructional leadership and decision-making responsibilities within a given school. In the multiunit elementary school, the IIC is composed of all unit leaders and the principal. In a very large multiunit secondary school, the IIC is composed of selected representatives from the Instructional Leadership Councils (or ILC, which is defined below) from each "house" of a secondary school employing the school-within-a-school concept. The IIC usually has formal meetings about once a week.

Instructional Leadership Council — The equivalent of the Instructional Improvement Committee for each "house" of a secondary school. A mechanism for sharing instructional leadership and decision-making responsibilities among unit leaders and administrators in each house.

Instructional Organization Pattern — A mechanism for structuring (relating) a school's resources (such as teachers, teaching strategies, time, and space) to influence learning outcomes for students in a positive manner.

Instructional Programing Model —A rational model, often called by its acronym IPM, for the selection and sequencing of teaching-learning strategies to facilitate improved learning through individually guided education (IGE). The sequence for major steps in stimulating learning according to the instructional programing model would include: setting school-wide objectives, identifying specific instructional objectives in performance terms, assessing entry-level skills for the learner, setting instructional objectives for the learner, planning the instructional program for all students in the unit, and assessing the degree to which objectives are satisfied.

Instruction Units — Sometimes called the I-units, the instruction units are one of four interrelated dimensions of the IGID Mod and the E Mod. Each I-unit includes clusters of three or four teaching-learning specialists, a set of support personnel, a set of instructional strategies, and instructional materials to promote individualization of learning. Differentiated staffing with a unit leader, teaching professionals, aides, and interns is typical in I-units.

IPM — An acronym for the Instructional Programing Model, which is defined elsewhere in this glossary.

I-Units — A partial acronym used to describe the instructional-units portion of an IGID Mod or an E Mod.

I Models — A set of four options for implementing an IGE/multiunit junior high school differentiated on the basis of the types of learner units formed, presence or absence of cross-grade grouping, and the number of disciplines included within the organizational model.

Junior High School — An attendance center designed for early adolescents. It may serve students from Grades 5 through 9.

Learner Units — Sometimes called L-units, learner units are one of four dimensions of all IGID and E Mods of an IGE/multiunit secondary school. Learner units are clusters of 75 to 150 students (in multiage or single-grade groups) established to promote the kinds of flexible groupings of various sizes and time durations that will satisfy individual learner needs.

Learning-by-Objectives — An approach to learning or a learning system that is based on establishing measurable performance objectives for all skills and concepts. Similar to outcomes-oriented learning systems, defined elsewhere in this glossary.

LICD — An acronym for the four interrelated units within each IGID and E Mod. It includes the learner unit (L), instruction unit (I), curriculum unit (C), and decision unit (D).

L-Units — A partial acronym for learner units.

Maxi-Mod or Maxi IGID Mod — An abbreviated term or partial acronym for one of several options available for the formation of "Individually Guided Inter-Disciplinary"

(IGID) Mods in an IGE/multiunit secondary school. The Maxi-Mod usually is based on four disciplines (subject fields), four teachers with one from each of the separate disciplines, and a four-hour block of time for instruction within an IGID Mod.

Middle School — A secondary school between the elementary and senior high school which does not have any standard or mutually-agreed-upon number of grades based on pupil age levels within the attendance center. It may serve pupils in Grades 5 through 9—the same range as the traditional junior high school. It is considered by some to be an alternative to the junior high school.

Mini-Mini Mod or Mini-Mini IGID Mod — An abbreviated term or partial acronym for one of several options available for the formation of "Individually Guided Inter-Disciplinary" (IGID) Mods in an IGE/multiunit secondary school. It is a single-discipline mod, with a three-teacher team and a one-hour time period for instruction within an IGID Mod.

Mini-Mod or Mini IGID Mod — An abbreviated term or partial acronym for one of several options available for the formation of "Individually-Guided Inter-Disciplinary" (IGID) Mods in an IGE/multiunit secondary school. It is based on two disciplines (subject fields), a four-teacher team with both disciplines represented, and a two-hour block of time.

M Models — A set of four options for implementing an IGE/multiunit middle school differentiated on the basis of the types of learner units formed, presence or absence of cross-grade grouping, and number of disciplines included within the organizational model.

MnIGID — An acronym used to identify a Mini IGID Mod, which is defined elsewhere in this glossary.

Model — An abstracted representation of reality which reveals the key elements and the pattern of relations among such elements within a situation, process, or thing.

Mod or Module — A basic unit, measure, or component of a larger configuration.

Modular Instructional Organization — An organizational or structural pattern designed to facilitate teaching and learning and based on a cluster of interactive components or modules which hopefully will produce a more humane learning environment.

Multiage Grouping — Formation of clusters of students for the purpose of instruction based on conscious desire to include two, and preferably more, learner age levels within the basic instructional units. To achieve this purpose 75 to 150 pupils may be placed in one unit.

Multiunit Elementary School — See IGE/Multiunit Elementary School and Multiunit School.

Multiunit School — An educational environment organized to facilitate learning and instruction. This product of the Wisconsin R and D Center efforts is a complex, comprehensive, and unified instructional organization pattern which includes such components as: creation of learner units with groups of 75 to 100 pupils in each, nongrading, continuous progress, differentiated staffing patterns, unit leaders, cooperative planning within teams, mechanisms to share instructional leadership and decision making (an IIC), variable instructional groupings, and the use of the Instructional Programing Model.

Multiunit Secondary School — See IGE/Multiunit Secondary School and Multiunit School.

MxIGID — Acronym for the IGID option known as the "Maxi IGID Mod," which is defined elsewhere in this glossary.

Outcomes-Oriented Learning Systems — A system for stimulating learning similar to the rational sequencing suggested in the Instructional Programing Model. It is based on specification of performance objectives for all learning tasks, assessment of entry-level achievement, determination of a satisfactory level for exit-level achievement, and use of criterion-referenced evaluation.

R and D — An acronym for Research and Development; as used here, it is usually related specifically to the Wisconsin Research and Development Center for Cognitive Learning.

School-Within-a-School — An organizational structure for large attendance centers, particularly those of the secondary level, based on placement of large clusters of students (500 to 1500) into separate and almost autonomous divisions known as "houses." A large school could be divided into two or more houses.

Secondary School — For the purpose of this paper, any middle, junior, or senior high school. It could start at Grade 5, 6, or 7, depending on the grade at which the elementary school terminates.

Senior High School — A postelementary school designed to meet the needs of those in the later years of adolescence. It may begin at Grade 9 or 10, following the termination of junior high or middle school.

S-IGID — An acronym representing the single-discipline "Mini-Mini IGID Mod," which is defined elsewhere in this glossary.

S Models — A set of four options for implementing an IGE/multiunit senior high school differentiated on the basis of the types of learner units formed, presence or absence of cross-grade grouping, and the number of disciplines included within the organizational model.

SMxIGID — An acronym representing the "Super Maxi IGID Mod," which is defined below.

Super Maxi IGID Mod — An abbreviated term or partial acronym for one of several options available for the formation of "Individually-Guided Inter-Disciplinary" (IGID) Mods in an IGE/secondary multiunit school. The Super Maxi IGID Mod is based on six separate disciplines within each unit, a six-member teacher team with a representative from each discipline, and a six-hour block of time for instruction within the IGID Mod. It is the organizational option with the largest number of disciplines and teacher team members.

Team Leader — See Unit Leader.

UL — An acronym for Unit Leader.

Unit Leader — A key instructional position within an elementary school unit or a secondary school IGID or E Mod. The coordinator of activities in the IGID or E Mod who unifies the contributions of the L-, I-, and C-units. A key position in all differentiated staffing patterns.

GPO 801-172-2

National Evaluation Committee

Helen Bain
Immediate Past President
National Education Association

Lyle E. Bourne, Jr.
Institute for the Study of Intellectual Behavior
Universiy of Colorado

Jeanne S. Chall
Graduate School of Education
Harvard University

Francis S. Chase
Department of Education
University of Chicago

George E. Dickson
College of Education
University of Toledo

Hugh J. Scott
Superintendent of Public Schools
District of Columbia

H. Craig Sipe
Department of Instruction
State University of New York

G. Wesley Sowards
Dean of Education
Florida International University

Benton J. Underwood
Department of Psychology
Northwestern University

Robert J. Wisner
Mathematics Department
New Mexico State University

Executive Committee

William R. Bush
Director of Program Planning and Management
and Deputy Director, R & D Center

Herbert J. Klausmeier, Committee Chairman
Director, R & D Center

Wayne Otto
Principal Investigator
R & D Center

Robert G. Petzold
Professor of Music
University of Wisconsin

Richard A. Rossmiller
Professor of Educational Administration
University of Wisconsin

James E. Walter
Coordinator of Program Planning
R & D Center

Russell S. Way, ex officio
Program Administrator, Title III ESEA
Wisconsin Department of Public Instruction

Faculty of Principal Investigators

Vernon L. Allen
Professor of Psychology

Frank H. Farley
Associate Professor
Educational Psychology

Marvin J. Fruth
Associate Professor
Educational Administration

John G. Harvey
Associate Professor
Mathematics

Frank H. Hooper
Associate Professor
Child Development

Herbert J. Klausmeier
Center Director
V. A. C. Henmon Professor
Educational Psychology

Stephen J. Knezevich
Professor
Educational Administration

Joel R. Levin
Associate Professor
Educational Psychology

L. Joseph Lins
Professor
Institutional Studies

Wayne Otto
Professor
Curriculum and Instruction

Thomas A. Romberg
Associate Professor
Curriculum and Instruction

Peter A. Schreiber
Assistant Professor
English

Richard L. Venezky
Associate Professor
Computer Science

Alan M. Voelker
Assistant Professor
Curriculum and Instruction

Larry M. Wilder
Assistant Professor
Communication Arts